WASHINGTON LETTER.

WASHINGTON, JUNE 20, 1890.

GEOGRAPHY OF THE SEA.—There is no branch of the Government service with a better record for disseminating practical and valuable information, than the United States Hydrographic office. A large share in the progressive state of the science of the geography of the sea, must be credited to its systematic collection of marine observations. In addition to the numerous charts, sailing directions, lists of lights, etc., which are permanent and standard publications, but continually revised according to the latest data supplied by thousands of correspondents in every part of the world, it issues monthly the well-known Pilot-chart of the North Atlantic (also a weekly supplement), and weekly, the *Hydrographic Bulletin* and a pamphlet entitled *Notices to Mariners*. The two former are issued from the division of Marine Meteorology, in charge of Everett Hayden, U. S. N., retired; the newest branch of the Office, but one that has already proved its usefulness.

The *Bulletins* contain descriptions of derelicts, wreckages, marine accidents, etc., and where located, and ice reports. The issue for June 6th had ninety-eight separate items. The *Notices to Mariners* describe newly discovered shoals, banks, dangerous rocks, changes in channels, lights, buoys, fog signals, etc. The Pilot chart is one of the most popular publications of the Government. Its high standard of efficiency, useful-

ness and reliability, is constantly and favorably commented upon both at home and abroad. Its value to commerce and to trans-atlantic steamers cannot be overestimated. The publication originated with this office, and it has no competitor. It delineates graphically the currents of the ocean, the changes that take place in them during each month, the quickest and safest routes where the best conditions for favorable passages are to be found, the probable limits of fogs, the locations of wrecks and changes in such locations, the course of derelict vessels, meteorological phenomena, on which is based a forecast of the weather for the month immediately following the date of issue, and the location and course of bergs and ice fields.

The chart for June illustrated the position and dates of icebergs reported during May. The region is southeast of Newfoundland and south and east of the Grand Banks. The routes plotted for the trans-atlantic steamers are south of this region. According to Lieut. Richardson Clover, of the Hydrographic Office, these enormous masses of ice drift down past the east coast of Newfoundland and far down along the eastern edge of the Grand Banks; but upon approaching the 41st parallel they reach the warm easterly-moving Gulf Stream current, and their southerly progress is arrested. Many of them hang about the tail of the Grand Banks, about 24° 30′ north, longitude 50° west, while others drift slowly off towards east-north-east, gradually melting and breaking up. He says that the idea that there is ice to an indefinite distance to the southward, and that it cannot be escaped is a vital mistake, and any one who has any idea of the completeness of the data received

from masters of vessels for use in preparing the Pilot chart, must realize how true is the clearly indicated evidence, that there is little or no ice south of the 42d parallel, and certainly none whatever south of 40° 30′ north. Moreover, the further north the more numerous, solid and massive are the icebergs ; and the further south the fewer, smaller and less compact.

Ensign Hugh Rodman, U. S. N., on duty in the Hydrographic Office, who has made a study of icebergs and field ice in the North Atlantic, says :* "The movements of the ice depend in a great measure upon the various currents that traverse the ocean, as well as upon a great variety of other forces, and little can be said with any degree of definiteness as to the probable movements of ice beforehand. Hundreds of vessels have been lost from ignorance of the local path of the ice, and many are damaged on the same account. There is great difference in the rates at which bergs travel. One may reach the southern waters the same year in which it is produced, while another may be several years going the same distance. The ice fields are a great obstacle to their progress, smashing them up, and causing their disintegration. They are very brittle, and sometimes a sharp blow of an axe or the concussion of the report of a cannon will demolish one. Quite often they have long outlying spurs projecting under the surface of the water, but as a rule they are nicely balanced and are quite apt to tumble over if disturbed. They are detected in fogs by their apparent blackness, but more often by the echo which they throw off from any such sound as a fog horn or a whistle."

* Address before the National Geographic Society.

It has been the desire of the Hydrographic Office to commence the publication of a Pilot chart of the South Atlantic and west coast of South America, and as a basis of the work, it has in preparation in connection with the reports of the United States Eclipse Expedition to the west coast of Africa, a set of daily weather maps of both oceans, from October, 1889 to May, 1890, the entire period of the cruise of the *Pensacola*. "The scheme determined upon,* consists in the preparation of a weather map for each day at noon, Greenwich mean time, from October 1, 1889, to May 31, 1890, for the entire area between lat. 70° N. and 60° S., long. 20° E. and 100° W. In addition to the Greenwich noon observations that are kept regularly for this office by nearly two thousand voluntary observers, it is earnestly desired that other navigators of these waters within the limits of time and place mentioned forward such data from their log-books as may be useful in this connection, selecting those observations that come nearest to noon, G. M. T., and stating as many details as possible regarding, wind, weather, state of the sea, and velocity and set of currents. In the case of a storm, hourly observations about the time of the lowest barometer will be very useful. Data from land stations are also very important. To make this great undertaking a success, there must be cordial co-operation amongst the nations interested in the meteorology of this vast area, and amongst navigators of every nationality. It is intended to publish the results in such form, and with such wide distribution as well to repay every one who contributes to its success.

* Note on Atlantic Pilot chart for June.

METEOROLOGY, ETC.—About twenty five members were present at the annual meeting of the American Meteorological Society in this city. Dr. B. A. Gould presided, and Mr. O. H. Tittman of the Coast Survey was Secretary. The papers read were: Instruments of valuation, by S. Dana Horton; Gold and Silver as measures of value, considered from a metallurgical standpoint, by Prof. T. Egleston; Remarks on the nomenclature of electrical units, by Prof. T. C. Mendenhall; and a supplementary paper on the same subject by Prof. Crocker of the National Association of Electricians.

The American Meteorological Society at a recent meeting held also in this city, adopted resolutions favoring the recognition of the eminent services of American electricians by perpetuating their names in the nomenclature of electrical units. It will be proposed at the Electrical Conference to be held in America in 1892 that the name of Joseph Henry—or some modification of it—shall be given to the unit of self-induction, "he having been the first to investigate that phenomenon and his investigations having been more complete than those of other electricians before or since."

The friends of the late Joseph Henry are urging upon Congress a gift $25,000 to his family in recognition of gratuitous services for many years as a valued member of the Light-House Board. Professor Henry's investigations, and experiments, as it is well understood, have saved hundreds of thousands of dollars to the Government. One of the most modest of men, he freely gave the results of his investigations to science and to the world. Letters patent would have secured him wealth in abundance and liberal competence to his family, but instead, he left

only the heritage of his great name and a moderate sum presented to him by his admirers a few years before his death. If the proposed gift were ten times as great, it would be but a small percentage of the gain to the American people from the free use of his scientific discoveries.

ECLIPSE EXPEDITION.—An Act was passed by Congress on the 2d of March, 1889, authorizing the Secretary of the Navy "to use $5,000 to defray the expense of sending a scientific expedition to the west coast of Africa to observe the total eclipse of the sun which will occur on the 22d of December, 1889." March 26th the Chief of the Bureau of Navigation appointed a Board consisting of Capt. R. L. Phythian, U. S. Navy, chairman, and Professors Simon Newcomb and Asaph Hall, U. S. N., to devise a plan and make recommendations.

In accordance with the report of this Board made May 28th, the Department organized the expedition in two parties,* and tendered the appointment of chief of one party to Mr. J. A. Rogers of Washington, and of the other to Professor David P. Todd of Amherst College, Mass. Mr. Rogers resigning his appointment, the Secretary of the Navy appointed Professor Todd to the charge of the expedition. Various new instruments were immediately constructed and other apparatus was obtained from the U. S. Naval Observatory, from the observatories and laboratories at Clark, Harvard, Johns Hopkins and Yale Universities, from the Massachusetts Institute of Technology, from the U. S. Coast and Geodetic Survey, the Army Signal Service, the National Museum, from the observatories at Allegheny, and Am-

* See Am. Geog. Society's BULLETIN No. 3, 1889—The Eclipse, 1889.

herst, Columbia and Princeton Colleges, from the U. S. Nautical Almanac Office and the U. S. Fish Commission; besides a large complement of important instruments by private loan. The apparatus embraced all the instruments necessary for the photographic registration of the partial phases of the eclipse, and for the complete photographic, spectroscopic, photometric and polariscopic study of the sun's corona.

The Secretary of the Navy detailed the *Pensacola* to convey the members of the expedition to the west coast of Africa and return them to the United States. The vessel sailed from New York on the 16th of October, 1889, and returned on the 23d of May, 1890.

The composition of the expedition was as follows:

David P. Todd, Director,	*Astronomy.*
Cleveland Abbe,	*Meteorology.*
Frank H. Bigelow,	*Astronomy.*
Arthur H. Brown,	*Natural History.*
W. Harvey Brown,	*Natural History.*
John E. Carbutt,	*Photography and Chemistry.*
Héli Chatelain,	*Languages.*
Herman S. Davis,	*Astronomy.*
L. Harold Jacoby,	*Astronomy and Geodesy.*
Eben J. Loomis,	*Botany and Ornithology.*
C. A. Orr,	*Anthropology.*
Erasmus D. Preston,	*Terrestrial Physics.*
Edgar J. Wright,	*Photography.*
Daniel H. Barlett.	
George F. Flint.	
M. O'Conner.	
G. E. Van Guysling.	

Professor Alexander Agassiz of Cambridge, and Dr. William J. Holland of Pittsburgh, were appointed by the Secretary of the Navy members of the expedition, but were obliged to decline the appointments.

The itinerary included the Azores, Cape Verdes, Sierra Leone, Gold Coast, São Paulo de Loanda, Cape Sedo, Cape Town, St. Helena, Ascension, and Barbadoes. There was not a stormy day from the beginning to the end of the voyage.

The preparations for the total phase of the eclipse were very elaborate, "nothing short of complete automatic operations of all the photographic instruments." But totality was completely clouded under, and, as Professor Todd says,* "instead of a fine accumulation of photographic data, I have only the gratification of having shown it to be practicable in the future for one eclipse observer to operate an indefinite amount of photograph apparatus quite as readily as, and with greater certainty than, he would have attended to only two or three cameras by hand heretofore." It was cloudy also at Cabiri, Cunga, and Dondo where auxiliary observers had been stationed, as well as at Cazengo, Oeiras, Muxima, Kakulu and Bom-Jesus. Observers on the *Pensacola*, 15 miles out at sea in the path of the central eclipse obtained no better results. No photographs of the corona were secured.

Numerous observations were taken from Cape Sedo where the weather was clear for a portion of the time. The direct view with the photo-heliograph of 44 feet focus proved an entire success. Each of the 22 inch circumpolar plates has ten images of the sun in eclipse, seventy of them being taken before the middle, and ten after totality.

While the main eclipse party was established at Cape Sedo, naturalists and anthropologists were in the in-

* *Nature*, May 1, 1890.

terior. Physical measurements were taken among several tribes; collections of folk-lore, fetishes and mind-products were made, and general information gathered. Both naturalist and anthropologist found the outlook so promising at the Cape that they applied for discharge from the expedition in order to continue the work on the peninsula. The naturalists of the U. S. National Museum were active in making collections at all ports. M. Chatelain remained at Angola to gather linguistic and ethnological material for various works he has on hand.

The researches of Professor Abbe, the meteorologist of the expedition, prosecuted with improved means and under rare conditions on sea and on land, are expected to produce most important results, and perhaps revolutionize some branches of that science.

In gravity research Mr. Preston, of the Coast Survey, swung the Pierce pendulums at Loanda, at Cape Town, at St. Helena, at Ascension, at Barbadoes and at Bermuda.

The early literature of this expedition bids fair to excite the cupidity of bibliomaniacs at least, inasmuch as the several works were printed in very limited quantities, and, with one or two exceptions, on board the *Pensacola*. But in order to preserve the record, and show collectors and others what they cannot have, a list is subjoined. The printers on the *Pensacola* were not idle.

Bulletin No. 1.—General. October 17, 1889.
" No. 2.—Meteorological, by Cleveland Abbe. October 18, 1889.
" No. 3.—Fish of the Congo Basin, by Theo. Gill. October 21, 1889.
" No. 4.—The Total Eclipse, by D. P. Todd. Nov. 1, 1889.

Bulletin No. 5.—Bibliography of Ki-Mbundu, by Héli Chatelain. November 5, 1889.
" No. 6.—Water spouts, by Cleveland Abbe. November 7, 1889.
" No. 7.—Provisional list of animals of Angola and vicinity, by F. W. True. Nov. 15, 1889.
" No. 8.—Eclipse photography, by Frank H. Bigelow. Nov. 20, 1889.
" No. 9.—Instrucções para observação do eclipse total do sol, por D. P. Todd. Traduzidas por H. Chatelain. December 10, 1889.
" No. 10.—Suggestions for amateur observers, by Cleveland Abbe. Dec. 10, 1889.
" No. 11.—Terrestrial physics, by E. D. Preston. Dec. 24, 1889.
" No. 12.—The total eclipse, by D. P. Todd. Dec. 31, 1889.
" No. 13.—Localities of scientific interest in St. Helena, by Cleveland Abbe. March 19, 1890.
" No. 14.—Bibliography of Angola and other parts of Africa, by E. J. Loomis. April 15, 1890.
" No. 15.—The law of distribution of the actinic light of the solar corona, by Frank H. Bigelow. April 19, 1890.
" No. 16.—A logarithmic system of sensitometer number, by Frank H. Bigelow. May 1, 1890.
" No. 17.—The automatic eclipse apparatus, by D. P. Todd. May 15, 1890.

U. S. Board on Geographic Names.—In January of this year the Hydrographer to the Bureau of Navigation of the Navy Department, finding no end of complications resulting from the variety of forms of orthography and nomenclature of geographic names of the same place, on Government charts and in official publications, communicated to the Superintendent of the U. S. Coast and Geodetic Survey, his desire to bring about a unified practice in the work of the two offices in the use of geographic names in future publications regarding Alaska. The Superintendent cordially responded, and Lieutenant Clover, the assistant hydrographer, was appointed to arrange with Professor Mendenhall plans to consum-

mate this work. It was found that of the entire vocabulary of Alaskan names, there was hardly a word that did not admit three or more forms of spelling, and frequently as many of nomenclature in official publications. It was felt that results would be much more general if the Geological Survey and Smithsonian Institution came into the agreement. In answer to a note from Professor Mendenhall, favorable replies were received from the Director of the Geological Survey and the Secretary of the Smithsonian Institution, and representatives were sent. From the outset the general opinion expressed was that there was need of unification in geographic names in all sections of the country as well as in Alaska, and that it would be very beneficial should a board of representatives from different bureaus, or departments, consider all geographic names throughout the country that are at variance, and decide upon a common orthography and nomenclature that would be acceptable to all departments. The need of such an agreement was so apparent and so strongly felt by heads of offices and bureaus directly interested, that a mixed board has come into existence, representing by appointment the various departments interested.

The Board as at present constituted consists of:

Prof. T. C. MENDENHALL, Superintendent U. S. Coast and Geodetic Survey, *Chairman.*

Lieut. RICHARDSON CLOVER, U. S. N. Hydrographic Office, Navy Department, *Secretary.*

Capt. HENRY L. HARRISON, U. S. N. Light-house Board, Treasury Department.

Capt. THOMAS TURTLE, U. S. Engineers, War Department.

Prof. OTIS T. MASON, Smithsonian Institution.

Mr. HERBERT G. OGDEN, U. S. Coast and Geodetic Survey.

Mr. HENRY GANNETT, U. S. Geological Survey.

Mr. PIERSON H. BRISTOW, Post Office Department,
Mr. MARCUS BAKER, National Geographic Society.

The composition of the Board is conservative to a marked degree. Every member of it has eminent qualifications for the position. It will create no surprises or sensations, but, acting simply as referee, will dispose of practical questions in such a manner as to carry the indorsement of the intelligent public.

The report of the committee on organization as amended and approved by the Board, April 23, 1890, states:

"It is the sense of the committee appointed to consider method and scope of work and organization of 'The United States Board on Geographic Names,' that the primary object of the Board should be to bring about consistency and uniformity of practice in the geographic publications of the various departments of the Government. We recommend that the Board should at first assume the simple character of a board of reference for intelligently disposing of such practical questions within its scope, as may be referred to it. As the usefulness of the Board will depend largely upon the quality of its work, it appears to be essential that rules should be adopted to govern certain classes of cases in orthography and nomenclature, at the earliest practicable date; we do not consider it advisable, however, that such rules and principles should be promulgated until their fitness has been fully tested. It is thought that the Committee might advantageously report at an early date, on the use of capitals, the use of possessives and on punctuation."

The officers of the Board consist of a Chairman, a

Secretary and an Executive Committee of three members. The Secretary is required to keep a record of the decisions rendered and the action of the Board on cases considered. He is also to notify each member of the Board in writing of the substance of every question referred to the Executive Committee for investigation. In cases wherein this Committee comes to unanimous agreement, the rules require that it shall file a statement of its conclusions with the Secretary. The tenor of this paper, together with the question under consideration, shall be transmitted by the Secretary to each member of the Board, and if after five days have elapsed no dissenting opinion shall be filed in reply thereto, the conclusions reached by the Committee shall be announced as the decision of the Board. In case, however, of a dissenting opinion being filed, the conclusion reached by the Committee shall not be announced, and the question shall be submitted to the Board for its action. The affirmative vote of a majority of all the members of the Board shall be required in the final decision of any case in Board meeting.

The designations of membership on this Board from the Executive Departments are all made by heads of each department. The following circular is an announcement by the Secretary of the Treasury:

CIRCULAR. GEOGRAPHIC NAMES.

1890. Department No. 28.
Light-house Board. No. 2.

TREASURY DEPARTMENT,
WASHINGTON, D. C., May 1, 1890.

To Officers of the Treasury Department:

Capt. H. L. Howison, U. S. N., member of the Light-house Board, is also a member of the United States Board on Geographic Names, and

has been designated by that Board as the representative from the Treasury Department.

The United States Board on Geographic Names is composed of representatives from Government departments interested in such matters, and is formed for the purpose of discussing and deciding as to the proper orthography and nomenclature of geographic names; to decide as to the adoption of names for geographic points and places, when such names are in dispute, either as to the correct names to be used, or as to the proper spelling of such names; also to decide as to suitable names for points or places not yet named, and as to changing names, which are now, or may be, clearly improper or unsuitable.

The officers of this Department having such questions arising in their several offices are requested to refer them to this Board for its action and decision.

Communications for the Board should be addressed to Lieut. Richardson Clover, U. S. N., Secretary United States Board on Geographic Names, Hydrographic Office, Navy Department, Washington, D. C.

WILLIAM WINDOM,
Secretary.

Among the many papers already submitted to the Board was a list from the U. S. Hydrographic Office containing 177 disputed names in Alaska, citing different authorities, all official excepting one. Take a few as examples:

NAME.	AUTHORITY.
Behring.	C. S. Coast Pilot of Alaska.
	Hy. O. chart No. 68.
	B. Ad. chart Nos. 2172 and 2558.
	Lippincott's Gazetteer.
Bering.	C. S. charts Nos. 960, 900.
	B. Ad. charts Nos. 278, 2460.
	C. S. Pacific Coast Pilot.
Behrings.	Hy. O. chart No. 528.
	C. S. Pacific Coast Pilot.
Amoughta.	Hy. O. chart No. 68.
Amukhta.	C. S. charts Nos. 960, 900.
	B. Ad. charts Nos. 260, 278, 2172, 2460, 2558.
Amoukhta.	Hy. O. chart No. 528.
Amuchta.	C. S. Coast Pilot of Alaska.

NAME.	AUTHORITY.
Becharoff.	C. S. chart No. 960.
L. Bochonoff.	Hy. O. chart No. 68.
Rochanoff Lake.	B. Ad. charts Nos. 2172, 2460, 278.
Oogahik.	Hy. O. chart No. 68.
Ugashik.	C. S. charts Nos. 900, 960.
Sulima.	B. Ad. charts Nos. 2172, 2460.
Stikine.	C. S. charts Nos. 900, 701, 960.
	B. Ad. chart No. 787.
Stikeen.	Hy. O. chart No. 527.
Lynn Canal.	C. S. charts Nos. 900, 701, 960.
Lynn Channel.	B. Ad. charts Nos. 787, 2172.
	Hy. O. chart No. 527.
Pumice Stone Bay.	Hy. O. chart No. 68.
Moorovskoy Bay.	C. S. chart No. 900.
Redoubt Volcano.	C. S. chart No. 900.
Burnt Mount.	B. Ad. chart No. 787.
Chinchinbrook.	Hy. O. chart No. 68.
	C. S. chart No. 900.
Hinchinbroke.	Hy. O. chart No. 68.
	B. Ad. chart No. 787.
Bering Haven.	C. S. chart No. 960.
Controllers Bay.	B. Ad. chart No. 278.
	Hy. O. chart No. 527.
	C. S. chart No. 702.
Controller Bay.	B. Ad. chart No. 787.
Comptroller Bay.	B. Ad. chart No. 2558.
Cape Yaktaga.	C. S. charts Nos. 900, 960.
Cape Yaktag.	Hy. O. chart No. 527.
	C. S. charts Nos. 701, 702.
Cape Yakaio.	B. Ad. chart No. 278.
Cape Yakiao.	B. Ad. chart No. 787.
Andreafsky.	Hy. O. chart No. 68.
Andreieffski.	C. S. charts Nos. 900, 960.
Andreievsky.	B. Ad. charts Nos. 2172, 278.
Andreaivsky.	B. Ad. chart No. 2460.
Golovine.	Lieut. Stoney's map.
	B. Ad. charts Nos. 2460, 2172.
	C. S. chart No. 960.
Golovin.	C. S. chart No. 900.
Golovnin.	B. Ad. chart No. 260.
	C. S. chart No. 900.
Golovain.	B. Ad. chart No. 278.

NAME.	AUTHORITY.
Golofnin.	Lieut. Stoney's map.
	B. Ad. charts Nos. 2172, 2460.
Tchegoula.	Hy. O. charts Nos. 68, 528.
Chegoula.	B. Ad. charts Nos. 2460, 2172, 260, 278.
	C. S. charts Nos. 960, 900.
Chugnel.	C. S. Pilot of Alaska,
Andreanowsky.	Hy. O. charts Nos. 68, 528.
Andreanoff.	C. S. charts Nos. 900, 960.
	B. Ad. charts Nos. 278, 2460, 2172.
Andreanov.	Lippincott's Gazetteer.

It is not expected that the Board will announce any decisions until the autumn, when it shall have had time to digest principles for guidance, and to consider the large amount of subject matter now in the hands of the committee.

ALASKA.—An exploring expedition, under the auspices of the National Geographic Society, left this city early in June for Alaska. The party is in charge of Israel C. Russell, who traversed the Yukon region in 1889, and Mark B. Kerr. Both gentlemen are connected with the United States Geological Survey. They will go to the almost unknown country northward of the St. Elias Alps to study, map out and photograph the glacial streams of that region. The steamer of June 14th will convey them from Seattle, and the U. S. S. *Pinta* will be at their disposal upon arriving at Sitka, for conveyance to Yakutat Bay, which will be the starting point inland. A detour thence of about fifty miles, crossing the range of mountains at a low point, will bring the party within reach of the ice fields.

It is not denied that an attempt will be made to reach the 19,500 feet summit of Mount St. Elias if the condi-

tions are found to be more favorable than those known to exist on the south side. Doubts have been entertained as to the advisability of sending out an expedition for glacial work so late in the season, but after an extended discussion and hearing the testimony of naval officers and others who have had large arctic experiences, the conclusion was reached that the month of September was favorable for mountain climbing. At the same time the explorers expect to make such good use of the intervening time in studying the glacial system of Alaska, about which so little is known, that if they should fail, as all others have, in reaching the coveted summit this year, they will not feel that the trip has been useless. The details of the expedition have been well planned.

Under the auspices of the Case School of Applied Sciences, of Cleveland, Prof. H. F. Reed is also engaged in physical investigations in connection with the glaciers of Alaska. With his usual courtesy the Superintendent of the U. S. Coast and Geodetic Survey has extended valuable facilities to Prof. Reed.

The English-Eskimo and Eskimo-English Vocabulary,* compiled by Roger Wells, Jr., U. S. N., and John W. Kelly, interpreter attached to the U. S. S. *Thetis*, contains a greater number of words than any similar work. The Bibliography of J. C. Pilling has between six and seven hundred titles of books wholly or in part relating to these languages, but in all that number is found but an exceedingly small list of available vocabularies, and of these none are readily accessible. Dr. Barton's Vocabulary, 1798, and Capt. John Washing-

* Circular of Information, No. 2, 1890, 72 pp., U. S. Bureau of Education.

ton's, 1850, and a little English-Aleutian Dictionary, prepared by Stephen N. Buynitzky for the Alaska Commercial Company in 1871, are out of print, so that the most accessible work is that of Lieut. P. H. Ray, found in his recent report of the International Polar Expedition to Point Barrow (1885). This report contains about seven hundred words and three hundred and seven phrases. Mr. L. M. Turner, who has had large experience in Alaskan exploration, has in preparation a vocabulary of about twelve thousand words. The Wells-Kelly vocabulary has eleven thousand three hundred and eighteen English and Eskimo words. It was prepared at the suggestion of Com. C. H. Stockton of the *Thetis*, and is the result of four years' (1884–'89) study and practice, one year with the natives alone, when no English word was heard. It was rewritten and corrected every four months. Perhaps not the least interesting and valuable part of this work is that relating to the Asiatic Eskimo, or, rather, the American Eskimo, who are settled upon the Asiatic side of Bering Straits.

The vocabulary is preceded by an interesting and original ethnography of the Eskimo in Alaska and Siberia, by Mr. Kelly, who has spent several years in actual communication with and study of the tribes. The growing importance, scientific, commercial and political, of this territory enhances the value of every original research, however brief.

Colorado Cañon.—Col. Robert Stanton, of the Denver expedition now exploring the comparatively unknown regions traversed by the Colorado River gives out a partial account of the journey down the wild

stream from the head of the Granite Gorge of the Grand Cañon to the mouth of Diamond Creek. The narrative is so graphic and yet concise that it will afford pleasure to those who read it. Of that portion of the Granite Gorge from its head to Bright Angel Creek, Colonel Stanton has this description in his note book under date of February 7th:

"The cañon is growing more and more picturesque and beautiful the further we proceed. The Granite has lost its awful and threatening look, and slopes back in beautiful hillsides of variegated black, grey and green. Above this, next to the river, is a stratum of dark sandstone cut into horizontal layers, standing in an almost perpendicular wall, jutting out in places to the edge of the Granite and studded all over with points standing out in the air: darker in color than those behind them and the top edge cut into smaller points and crevices through which the light shines, giving a rough beaded appearance. As we look down the river or up a low side cañon, with the placid water between its polished walls of black and grey and green for a foreground, there rises above the dark sandstone tier upon tier, bench upon bench, terrace upon terrace, stepping back further and further and higher and higher, and in their immensity of height and proportions seeming to tower almost over our heads. First above the darker sandstone come the flattened slopes of the lime and mineralized matter in horizontal layers of yellow, brown, white, red and green. Then rise sheer walls of stained marble 1,000 feet or more, the lower portions yellow, brown and red, and the coloring of red growing brighter as it nears the top. Above this smaller benches of mar-

ble, at the top of each a little *mesa* covered with green grass and bushes, and above these a dozen or more terraces of scarlet and flame-colored sandstone, stained on their outer points with black, and the little benches between them relieved by the bright green of the greasewood and bunch grass, the whole covered with, perhaps, a couple of thousand feet of the lighter grey, yellow and white sandstone ledges, capped by pinnacles and spires, turrets and domes in every imaginable shape, size and proportion, with all their slopes covered and their tops fringed with pine, cedar and pinion trees, whose bright green stands out in bold relief against the flaming colors of the sandstone and the banks of pure white snow that cover the top and have run down into the many gulches along the sides.

"On many of the long stretches where the river can be seen for several miles the picture is one of grandeur and beauty. Grand with its walls of bright colors towering 2,500 feet overhead, beautiful in its long calm green slopes, with the quiet waters sparkling in the sun at their foot. From the mouth of the Kanab Wash for about twenty miles down is perhaps the narrowest and deepest part of the great inner gorge. At the bottom of the gorge is from 150 to 200 feet wide and the river runs between vertical walls, and fills the whole space from wall to wall. The walls of this portion of the cañon rise above the water about 3,000 feet, the benches are narrower and the vertical cliffs between the benches higher than in any other section. From one end to the other of this section there is a bench about 50 feet above high water, running almost parallel with the grade of the river, of solid marble wide enough to

build a four-track railroad upon, and not interfere with the perpendicular walls above or the river below."

GEOGRAPHICAL SURVEYS.—The geographical report of Capt. George M. Wheeler, Corps of Engineers, U. S. A., being vol I. of the Report upon geographical explorations and surveys west of the 100th meridian, has been printed (4to. 780 pp., 38 plates, 3 maps). This report was substantially brought to a close in 1879, but not presented for publication until 1887. Volumes 2 to 7 and a supplemental volume were printed between the years 1875 and 1879. About one-third of the present volume is occupied with descriptions of the areas covered by surveys west of the 100th meridian under the direction of the War Department. A valuable chapter entitled "Considerations upon National Government Land and Marine Surveys" is followed by a very important memoir upon the voyages, discoveries, explorations, and surveys to and at the west coast of North America and the interior of the United States west of the Mississippi River from the year 1500 to 1880. This memoir embraces:

1. An account of geographical discovery on the west coast and interior from 1500 to 1800, with a chronological list of expeditions. The "list" was submitted to the late James Carson Brevoort, Rev. Dr. B. F. De Costa, Henry Harrisse, Professors Fischer and Ruge, and revised in accordance with their suggestions. It is followed by photo-lithographs of tracings of certain old maps, with notes, intended to illustrate the progress of geographical information as to the North American continent during this period. The maps reproduced are:

The Island of Antilia, by Benincasa, 1463 (one of

the first maps indicating larger countries to the west of Europe).

America, from Ptolomæus, edit. Romæ, 1508.

America, from a globe in Frankfort, about 1520 (believed to be the first map upon which the name "America" appears).

North America, by Abraham Ortelius, 1589.

North America, by Zattieri, 1566 (reputed to be the first map upon which the Straits of Anian, between Asia and America appear).

America, from "Hondius," ed. 1609.

North America, from Purchas, 1625 (constructed to prove the possibility of a north-west passage).

America, by F. DeWit, Amsterdam, about 1670.

North America, by John Senex, London, 1710.

North America, by Edward Wells, 1722.

North America, by Thomas Jeffreys, 1782.

2. An epitome of Lieut. G. K. Warren's memoir, giving a brief account of each of the English expeditions since 1800 (to 1857), with added notes.

3. An account of explorations and surveys from 1857 to 1880.

A very large amount of valuable information nowhere else accessible is brought together in this volume, which would have been given to the world much earlier but for the prolonged illness of the author. It is the key to the whole history of U. S. Government surveys, and its usefulness is further augmented by an index of subjects and an index of names.

IRRIGATION.—The advance sheets of the tenth annual report of the United States Geological Survey, by J. W.

Powell, Director, contain the first annual report upon irrigation for the year ending June 30, 1889.

It is stated that the area of the arid region is about 1,300,000 square miles—one-third of the entire country. Major Powell interprets the law governing the survey, "not as authorizing the construction of works of irrigation, but as directing a comprehensive investigation of prevailing conditions, the whereabouts of irrigable land most eligible for redemption, and its segregation for homestead settlement and canal sites; the seepage; the evaporation; the vested rights, and how to maintain them; and, generally, the most economical methods of bringing the land and water together." He has been led to these conclusions from a careful consideration of the statutes and the executive correspondence preliminary thereto, and from examination of the reports made by committees of Congress, and the Congressional debates on the subject.

Acting under these convictions he submitted to the Secretary of the Interior for his approval, which it received, a plan for the survey, which is divided into three parts:

I. The topographical survey.
II. The hydrographic survey.
III. The engineering survey.

The topographic work consists of surveys delineating the topographical features of the country, the areas of all drainage basins, the courses of streams, the situation of lakes, springs, and other bodies of water; the positions of possible reservoir sites, the location of dams and canal lines, and the altitude, position and general character of all irrigable lands.

The hydraulic and engineering work consists of the measurement of rain-fall and the study of general meteorology, measurement of river-flow, evaporation, and matter carried in suspension by water; the ascertainment of the duty of water, and the determination of the mode and cost of construction of dams and canals, and of the areas and contents of reservoirs.

It is not necessary here to advert to the numerous intricate problems—present and future—involved in an undertaking of this magnitude.

Work has been prosecuted in Montana, Utah, Colorado, New Mexico, Idaho, Nevada and California, with the following results:

Total area mapped out, square miles	43,530
Total area surveyed, " "	21,766
Reservoir sites selected for segregation	127
Reservoir sites surveyed	34
Canal sites surveyed	4
Total segregations of irrigable lands, acres	30,055,120

With succeeding appropriations work will be continued in these localities and carried on in North and South Dakota, Nebraska, Kansas, Indian Territory and Oklahoma, Texas, Wyoming, Arizona, Washington and Oregon.

The special committee of the United States Senate on the irrigation and reclamation of arid lands, of which Senator Stewart, of Nevada, is the chairman (the other members being Senators Allison, of Iowa; Hiscock, of New York; Plumb, of Kansas; Gorman, of Maryland; Jones, of Arkansas, and Reagan, of Texas), has submitted reports (majority and minority), accompanied by testimony, maps and drawings, the whole forming several volumes, and by far the largest and most important

contribution to the American literature of irrigation yet made.

While the entire committee is in sympathy with irrigation, the views of the majority and of the minority as to the methods of accomplishing the work are not in harmony, and an active controversy has resulted. It is claimed by the majority (Mr. Stewart and others) that *topographic* survey of the arid regions is unnecessary, slow and expensive ; that it be discontinued. That the hydrographic branch should be turned over to the Signal Service ; and, as they differ with the director as to the method of conducting the survey, that the work be placed under the direction of a Commissioner of Irrigation, subordinate to the Department of Agriculture.

It is the opinion of these gentlemen that in order to specify irrigable lands it is only necessary that irrigation engineers first go over the country to find out what lands are irrigable. They must identify what townships and sections include the irrigable lands, represent them on a transcript of the Land Office map, and report them, section by section, to the Land Office. That topographic maps are of some convenience in the way of general information of a geographical character, but that they can be dispensed with without any serious inconvenience. That the maps already in existence, viz. : Land Office surveys, railroad surveys, and the topographical surveys of Wheeler, Hayden and Powell furnish sufficient information for the guidance of the engineers.

But by far the most important recommendation of the majority is for the repeal of that portion of the section of the Act of October 2, 1888, which provides that "all

the lands *made susceptible of irrigation* by reservoirs, ditches, or canals shall be reserved from sale as the property of the United States, until provided by law."

The bill submitted by the majority reserves the unappropriated waters of the lakes and rivers on the public lands for such beneficial uses as shall be determined by the States and Territories in which such waters are situated, and places them under the control of the States and Territories, subject only to the paramount authority of the United States. It reserves the right of way for ditches, canals, and other hydraulic works for the use of irrigation, and allows the flowing waters to be diverted from the natural beds of streams upon the arid areas. Access is also reserved over the public land, west of the ninety-eighth meridian west, to all natural waters on the public lands for man and domestic animals. It also reserves to the United States the adjudication of all questions and disputes that may arise in relation to the storage, conservation, flowing and distribution of all natural waters, flowing or standing, located within or passing through the boundaries of two or more States and Territories within the area described.

The minority of the committee (Messrs. Reagan, Gorman and Jones), recommend Congressional action which is opposed to that recommended by the majority. They are of opinion that the present irrigation survey is performing its duties in compliance with law, and in an efficient and thorough manner, and that the work under it should proceed at a reasonable rate of progress until it is finished. It is estimated that survey will cost $7,000,000, but that in making the maps it will save $4,000,000 to the Geological Survey. Thus the real

cost of the irrigation survey will be but $3,000,000 over and above the cost of the geological survey. The survey needed for the sub-humid region of the Great Plain is purely a geological survey based on topography. The topographic work is necessary, economical and legal, and is believed to be the proper basis for a hydrographic survey.

The creation of a new bureau of irrigation in the Department of Agriculture is considered unnecessary and unwise, and reasons are advanced why the hydrographic branch of the work should not be turned over to the Signal Service.

They claim that the legislation already accomplished by the Act of October 2, 1888, which reserves the sites for irrigating works in the hands of the general government, and reserves the lands made susceptible of irrigation thereby from homestead settlement is wise, and should not be repealed. The desert-land laws and the pre-emption laws and the timber-culture laws which are in effect repealed by that act, should not again be made operative, for by their agency large tracts of land have heretofore been aggregated in the hands of wealthy individuals and corporations. That the bill reported by the majority of the committee is in the interest of the great cattle companies that pasture their animals on the public domain, and opposed to the interests of the farmers making homesteads on the lands. That the land should be held for settlers, and not for speculative syndicates and companies who would sell or rent the broad acres at their own price.

The Constitutional Convention of Idaho in August 1889, memorialized the Secretary of the Interior as fol-

lows : " Whereas, the Government of the United States has taken steps towards redeeming the arid lands of the West . . . . and

Whereas, for the purpose of establishing a thorough system of storage reservoirs, canals, and irrigating ditches, engineering parties are making surveys for this purpose ; and

Whereas, it is learned that the plans of the Government are threatened to be thwarted by speculators having men to follow up these surveys to make filings on lands, reservoirs, and canal locations ;

Resolved, By the Idaho Constitutional Convention, now assembled at the capital of said Territory, having the good of the general public and the good of the people of Idaho, with the prosperity of the Territory at heart, do hereby memorialize the Department of the Interior to take such action at once as will remedy the evils which threaten this fair Territory in the manner outlined in this memorial."

This memorial was the basis of the memorable circular from the General Land office under date of August 5, 1889, and sent to registers and receivers of the United States district land offices, which after citing the provisions of the Act of October 2, 1888, promulgated the following order :

" You will therefore immediately cancel all filings made since October 2, 1888, on such sites for reservoirs, ditches, or canals for irrigating purposes and all lands that may be susceptible of irrigation by such reservoirs, ditches, or canals, whether made by individuals or corporations, and you will hereafter receive no filings upon any such lands."

The features of the minority's bill are: 1. Provision for a survey of the arid lands into natural irrigation districts. 2. The segregation of the irrigable lands. 3. Lands already irrigated shall be declared irrigable for the purposes contemplated. 4. Certain irrigation works shall be constructed only on sites designated and reserved therefor, in order to protect water rights and to conserve the waters for beneficial purposes. 5. The division of the waters among the districts. 6. Organization of districts situated in two or more States and Territories. 7. Non-irrigable lands shall remain in the possession of the Government as forage and pasturage reservations and catchment areas for irrigable lands. Irrigable lands to be disposed of to homestead settlers in tracts not greater than 80 acres. 8. The attachment of water rights to the homesteads of the irrigable lands. 9. Unauthorized irrigation works unlawful. 10. Plan for the organization of irrigation districts. 11. Laws and rules for the use of the waters belonging to the districts and for the protection and use of the forests and pasturage. 12. General legislation by States and Territories relating to the use of the waters, forests and pasturage. Methods by which the capital for the construction of irrigation works may be obtained. 13. States to provide boards of irrigation commissioners to supervise and approve works authorized and contracts made by district commissioners.

The general effect of this bill is to turn over the control of irrigation to the States and the districts, the general statutes to be made by the States, and the specific rules by the districts. Therefore, it will accomplish local self-government in relation to irrigation and the forest and pasturage administration. It relieves the general gov-

ernment of all subsequent legislative and administrative duties, except only to complete the irrigation survey of the whole, and the linear survey of the irrigable lands, and also to administer the homestead laws, coal-land laws, mining-land laws, and town-site laws through the General Land Office.

There has as yet been no Congressional action on either bill. Meanwhile the full amount ($750,000) asked by the directors for work of the survey under existing plans, for the fiscal year 1890–91, has been favorably reported and passed upon in the House of Representatives.

INTERCONTINENTAL RAILWAY.—Of perhaps greater importance than anything else considered by the recent conference of American nations was the international railroad idea, and no other matter which was before the Conference has been advanced to such a position. The report of the committee on railway communication was not finally acted upon until late in April. On the 19th of May the President of the United States communicated this report to Congress with a special message, and on the 29th of the same month the Committee on Foreign Affairs of the House of Representatives reported a bill "to provide for a survey and to encourage the construction of a continental railway to connect American nations," embodying some of the provisions recommended by the Conference; that is to say, an invitation to the several South American governments to co-operate with the Government of the United States in the appointment of an international commission of engineers to examine the possible routes and report their length, cost and advantages, and make proper surveys for a continental railway to connect the United

States with other republics of the American continent; each government to pay its proportionate part of the expense of the survey.

In opening railways between the Atlantic and Pacific oceans, the United States and Canada and other countries have performed works of equal or greater magnitude than will probably be required to establish unbroken railway communication with all the republics south of us.* The building of the Baltimore and Ohio and Pennsylvania railways over the Allegheny mountains were greater undertakings than that of an intercontinental railway would now be. The most difficult portions of a railway to South America will not exceed those of the Mexican railway from Vera Cruz to the City of Mexico, or those of the Panama railway across the isthmus. Much has already been accomplished in the different Spanish-American countries in building parts of the proposed through line, which, when combined, will reduce the entire work and distance almost one-half; so that not only can continuous railway communication with those countries be considered feasible, but also in a fair way to be realized. From the southern terminus of the railroads now in operation in Mexico to the northern terminus of the Argentine system the distance is estimated at 4,900 miles. In this distance 230 miles are now in operation; of the remaining distance about 1,800 miles are already under survey and construction, which, when completed, will leave about 2,870 miles to be located and constructed in order to complete the line that will eventually unite the republics of the Western hemisphere,

Lieut. George A. Zinn, Corps of Engineers, U. S. A.,

* Report of Henry G. Davis and Andrew Carnegie, delegates from the U. S. to the International American Conference.

at the request of Messrs. Davis and Carnegie, members of the committee on railway communication of the International American Conference, prepared an elaborate paper with reference to the railways of Mexico, Central and South America, and the prospects of railway building in these countries, especially with reference to an intercontinental line; in which he described the topographical features of each group and of each country, especially in those parts where there has been but little railway development. All existing railways are noted, and the most important described; while full information is given as to projected lines, concessions, finances, etc. He also outlines a plan for an intercontinental railway, adding articles on railway gauges and metal ties.

KOREA.—Mr. J. B. Bernadou, U. S. N., recently entertained an audience in this city with an account of the Koreans. His reminiscences were personal, for he was for some time attached to the American legation at Seoul. He said that the native maps of the country were not reliable, and that the reason why no accurate one existed was because foreigners have only of late years been allowed to penetrate the interior. The ignorance of the Koreans of the outside world, prior to the treaties of 1881–82, was remarkable. The lecturer exhibited a native conception of the earth. The map represented the earth as a circular plane with the land and its outlying islands in the centre, and a ring of unbroken water upon the outside. Around the central area of the mother (China) are grouped different States, among which Korea and Japan are on the eastern side, and some of the European nations on the western. The conservatives yet cling to their old-time notions.

Korea is a mountainous country, with a main chain, bearing an extinct volcano, forming the back-bone of the peninsula. The coast is forbidding. The climate exhibits wide ranges of temperature, from a Nova Scotia winter in the north-east to that of Louisiana in the south. The winter in all but the southern parts is long and severe, and sets in with great suddenness. Mr. Bernadou accounted in an interesting way for many of the traditions and distinctive habits of the people of this little-known region.

POOL OF BETHESDA.*—The excavations of the Algerine monks under the ruins in the rear of the Crusader church of St. Anne in Jerusalem, have gradually transferred opinion from the Birket Israel in favor of the former locality as the site of the Bethesda. This opinion has been strengthened by the discovery of a rock-hewn pool containing water, beneath three successive structures. Subsequent excavations revealed the remains of two tiers of five-arched porches, the lower tier being in the pool. The intelligent labors of the monks who are in charge of the property have been further rewarded by the recent discovery of another pool, containing a good supply of water, to the westward of that first discovered; the whole agreeing with the descriptions of the Bethesda, as given by the fathers of the Church and Christian pilgrims and writers as early as the fourth century. The correspondence in number of the five porches to those mentioned in the Gospel of St. John will not escape notice. Steps cut in the rock lead down to the water. An ancient Christian church in ruins surmounts the entire space. The remains of the upper tier of porches extend above the pool at right angles from the

* Dispatch from Henry Gilman, U. S. Consul at Jerusalem.

north wall of the crypt beneath the church, in which the apse, at the east end, though dilapidated, is distinctly defined. On clearing away the debris that choked the fifth porch westward of the apse, all these discoveries culminated in revealing the remains of a painting, or fresco, upon the plaster of the wall in the rear, the colors of which, quite bright when first discovered, have since greatly faded.

A summary of the discovery would be about as follows: First, the rubbish covering the ruins, and built upon by modern Turkish houses; next beneath is the small church with apse; under this the crypt with five porches containing the frescoes; and fourth, underneath all, the pool itself, cut in the solid rock, and with five arches of well preserved masonry.

NEW ZEALAND.—The United States Consul at Auckland, in a recent communication to the Department of State says that it is impossible to appreciate, or have any adequate conception of, New Zealand's superiority over the other Australian colonies. He makes comparison of several economic and industrial features, common to all of them, but showing preponderating percentages in favor of New Zealand. The wonderful productiveness of her soil is, in many respects, unequalled in the world. The colony is also rich in all kinds of minerals which as yet have not been properly developed. The climate is mild, equable and invigorating. He is surprised that more is not known of the numerous natural hot springs and lakes, and of the health-restoring properties of the former, and sees no reason why New Zealand should not become the invalid's paradise.

H.